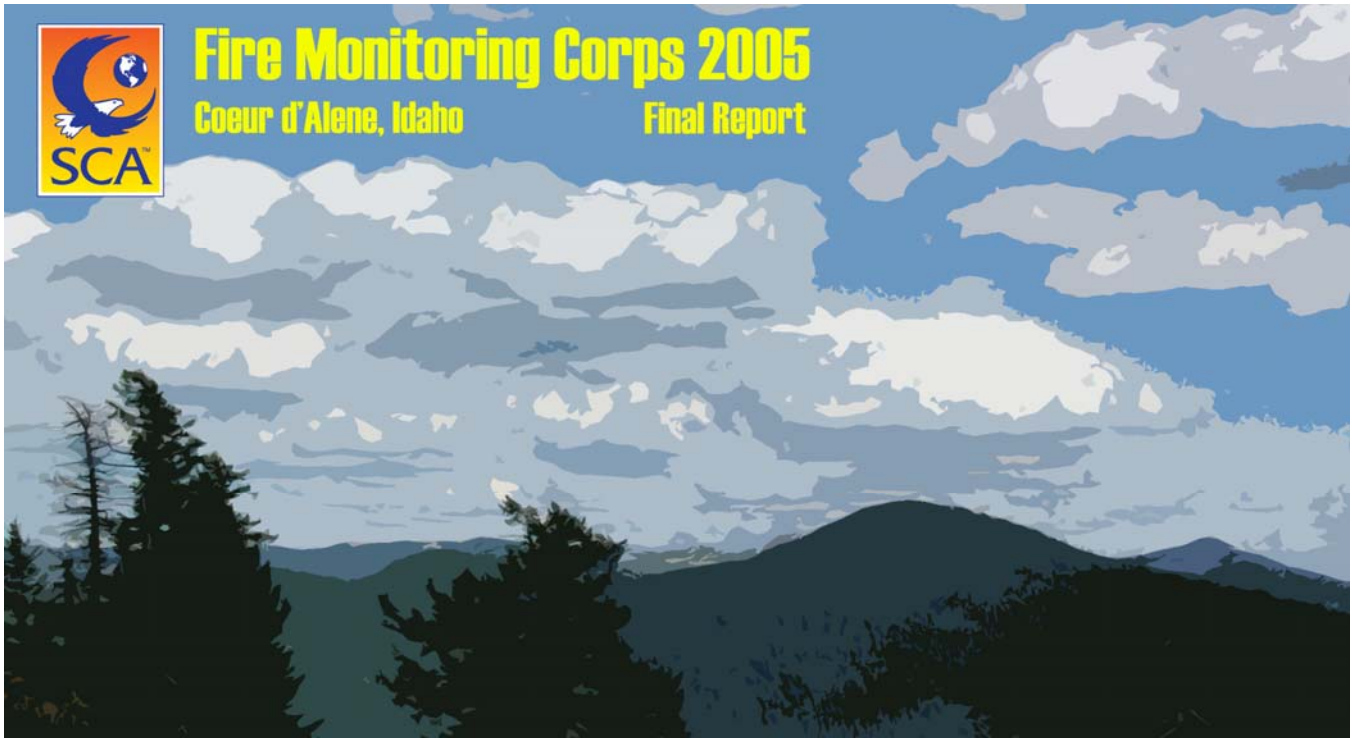




Fire Monitoring Corps 2005

Coeur d'Alene, Idaho

Final Report



FINAL REPORT

15 November 2005

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Introduction

This final report serves a variety of functions and is meant to address several audiences. It will serve as a written record of the work we have accomplished in these six months and will be a reference to the GIS and Fuels managers for questions regarding site specific interpretations of Firemon protocols and methods. In the pages that follow, we explain all the specifics and exceptional cases that we encountered in the field so that data may continue to be collected using consistent methodology. This report may also be useful to other audiences as a more basic explanation of what the Firemon program is and how it was applied here on the Coeur d'Alene Reservation. Finally, it will serve as a resource for us personally in the future, whether showing it to employers or as a reference for future studies.

SCA Role

The Student Conservation Association (SCA) is a non – profit organization built on the concept of helping young people pursue their diverse career goals while performing valuable conservation service. The organization provides opportunities for students to work with governmental land management agencies, in addition to non-profit and private companies while providing a chance to learn about different communities across the United States. The Fire Monitoring Corps, also known as Firemon, is a component of the SCA Corps Programs based out of the Boise office. Our crew worked with the BIA and the Coeur d'Alene Tribe as a part of the Fire Monitoring Corps, using Firemon protocols to collect vegetation and fuel load data. For six months, we were a part of the Coeur d'Alene Tribal community. We participated in celebrations and tribal and events while helping the Tribe achieve its goals for conservation and fire management.

Firemon

The Fire Effects and Inventory System (Firemon) is a comprehensive sampling method created to assist fire managers in their management objectives. Before Firemon was developed, many fire managers did not have consistent or adequate resources to conduct informative surveys of pre and post burn vegetation cover, fuel load, and ecosystem effects.

Firemon was developed partly as a reaction to a series of severe fire seasons. The Joint Fire Science Program funded the creation of a coherent and nationally standardized sampling method so that different agencies and regions could share and compare data. The creators of Firemon integrated flexibility into field methods so that fire managers can collect special data fields (or local codes) that apply only to their site.

In August of 2000, Congress passed a bill that funded the National Fire Plan. It included monies for activities including thinning projects, fire education, and monitoring. The bill especially focused spending on Wildland Urban Interface areas – where humans and fire collide, which is

where the most drastic consequences can occur. The bill also focused on the BIA and Tribal lands, requiring fuel monitoring programs on all lands managed under the umbrella of the Bureau of Indian Affairs. The BIA decided to use the Firemon program to accomplish this.

Relationships

The partnership between SCA and the Coeur d'Alene Tribe is unique compared to relationships at other SCA-BIA sites. Our team at Coeur d'Alene works directly with the GIS department, whereas most teams work directly with fuels specialists, fire crews, and forestry departments. Most team's data is being used to continually monitor changes to areas pre and post fuels treatment. However, our data is going to be used primarily in conjunction with LIDAR and other remote sensing data to map fire danger and model fire behavior across the Reservation, and parts of Kootenai and Benewah Counties. In conjunction with Potlatch Timber Company, Inland Empire Paper Company, and the Idaho Department of Lands, the Tribe extended data collection outside the boundaries of the Reservation. By cooperating with the Tribe, each of these landowners will have access to the data collected on their land. These landowners will also benefit from increased awareness of fire behavior potential on their land holdings.

History of Coeur d'Alene Nation - Schitsu'umsh

The Coeur d'Alene reservation consists of 345,000 acres of land in North Idaho, near Spokane and Coeur d'Alene (Tribal Website, 2005). As of 2005, the Tribe has 1,992 enrolled members. The Coeur d'Alene Tribe's aboriginal territory extends across several river basins from eastern Washington to western Montana. Historically, they traded with other tribes in order to obtain the few resources that were not readily available. A French trader, who found the tribe to be very experienced and skilled at trading, gave the tribe the nickname Coeur d'Alene, which means "Heart of the Awl". The Tribe continues to be known by that name to this day.

How and Why We Are Monitoring

With a grant from the US Geological Survey, the Tribe has taken an approach to mapping data which draws heavily on the LANDFIRE process, designed by the EROS Data Center, part of the USGS. "The objective of the LANDFIRE Project is to provide the spatial data and predictive models needed by land and fire managers to prioritize, evaluate, plan, complete, and monitor fuel treatment and restoration projects essential to achieving the goals targeted in the National Fire Plan (Landfire Website, 2005)." In short, the Coeur d'Alene Tribe is using the data gathered by our crew in conjunction with existing Continual Forest Inventory (CFI) and remote sensing data to produce GIS layers that will help local land and fire managers make more informed decisions about fuels reductions projects, managing fires, and mitigating risks. This is the first time that the LANDFIRE process has been applied on a reservation or at a local level. The success of this project could lead the way for other LANDFIRE-like projects at the local and or Tribal level.

Data Summaries

Continual Forest Inventory

Continual Forest Inventory (CFI) plots are plots the Coeur d'Alene Tribe's Forestry Department has permanently established on Tribally owned forested lands throughout the Reservation (Figure 1). Most of the plots are monitored every ten years to gather "periodic information on status and trends on a variety of parameters describing forests and forest use:

area and type of forest, structure and composition of forests in terms of species, sizes, and volume; rates of tree growth, mortality, removals....and information on harvest efficiency and product flows (US Forest Service Website, 2005).” The CFI plots were concentrated in certain areas within the Reservation, namely Grassy Mountain, Engel Mountain, Eagle Peak, Moses Mountain, and the Plummer area (Figures 2,3,and 4).

We located CFI plots using ESRI’s ArcMap and ArcPad software in conjunction with Trimble Recon GPS units and the Tribe’s CFI Plot Location Cards. These plot cards were not a dependable source of information and should not be used exclusively to locate plots. Habitat types listed on the cards were frequently incorrect, sometimes due to harvesting, but were occasionally due to observational error. Most CFI plots are marked with a piece of rebar or PVC pipe sticking six inches out of the ground, but in exceptionally brushy or grassy plots, they are often marked with a green metal fence post. Most CFI plots also feature reference trees in the general vicinity of plot center and are marked with tags that give the distance and azimuth (direction) to plot center. On a few occasions, the azimuth bearings on reference trees were off by 180 degrees. Reference trees also feature two types of azimuth bearings. The more common type was a bearing from 0 to 360 degrees. The other, less common type, gives readings such as N 80° W (this would be expressed as 80° west of true north, or 280°).

On CFI plots we collected Plot Description, Species Composition and Fuel Loads, but did not collect tree data. The Tribe had previously existing tree data from the last CFI survey in their database. Some previously tagged trees extended beyond our plot, which indicated CFI plots are sized slightly different than FIREMON plots. On the rare occasion that a plot center stake could not be located, steps were taken to temporarily establish a plot center and are noted in the comments section of the Plot Description in the FIREMON database.

Special Considerations

Plots 88-108 are on land that may have been involved with a land swap with Potlatch in the past (Figure 3). These plots did not have previously collected tree data in the database, nor were their GPS points accurate. Sometimes the points were between 300 and 900 feet off. We temporarily established plot centers at the given GPS point when the actual plot could not be found. These exceptions were also noted in the Plot Description comments section.

Idaho Department of Lands

Idaho Department of Lands (IDL) plots are used by the state primarily for timber cruising. We assessed them with standard Firemon protocols. Most of these plots are located southeast of the Reservation (in the Santa and St. Maries area), but there are a few located within the Reservation boundary (Figure 5). GPS points for IDL plots are arranged in groups of three, with suffixes of 001-003 (i.e. 424001, etc.) Except for one instance, we did not locate any physical evidence of previous assessment (plot center markings, tagged trees etc.) at the GPS coordinates that we used.

Because of the lack of markings, we generally established plot center by navigating as close as possible to the center plot (the plot numbered with 002 suffix) and then simply chose the closest tree as plot center. We flagged the plot center tree and wrote the plot number on the flagging. On IDL plots, we collected Plot Description, Species Composition, Fuel Loads and Tree Data, including slope, aspect and elevation.

Perhaps the most difficult aspect of IDL plots was finding roads that led to the plots. The roads layer that we used was very inaccurate on IDL owned land. Many of the roads on our

Figure 1: All plots visited in 2005 by SCA crew.

CDA Firemon Plots - '05

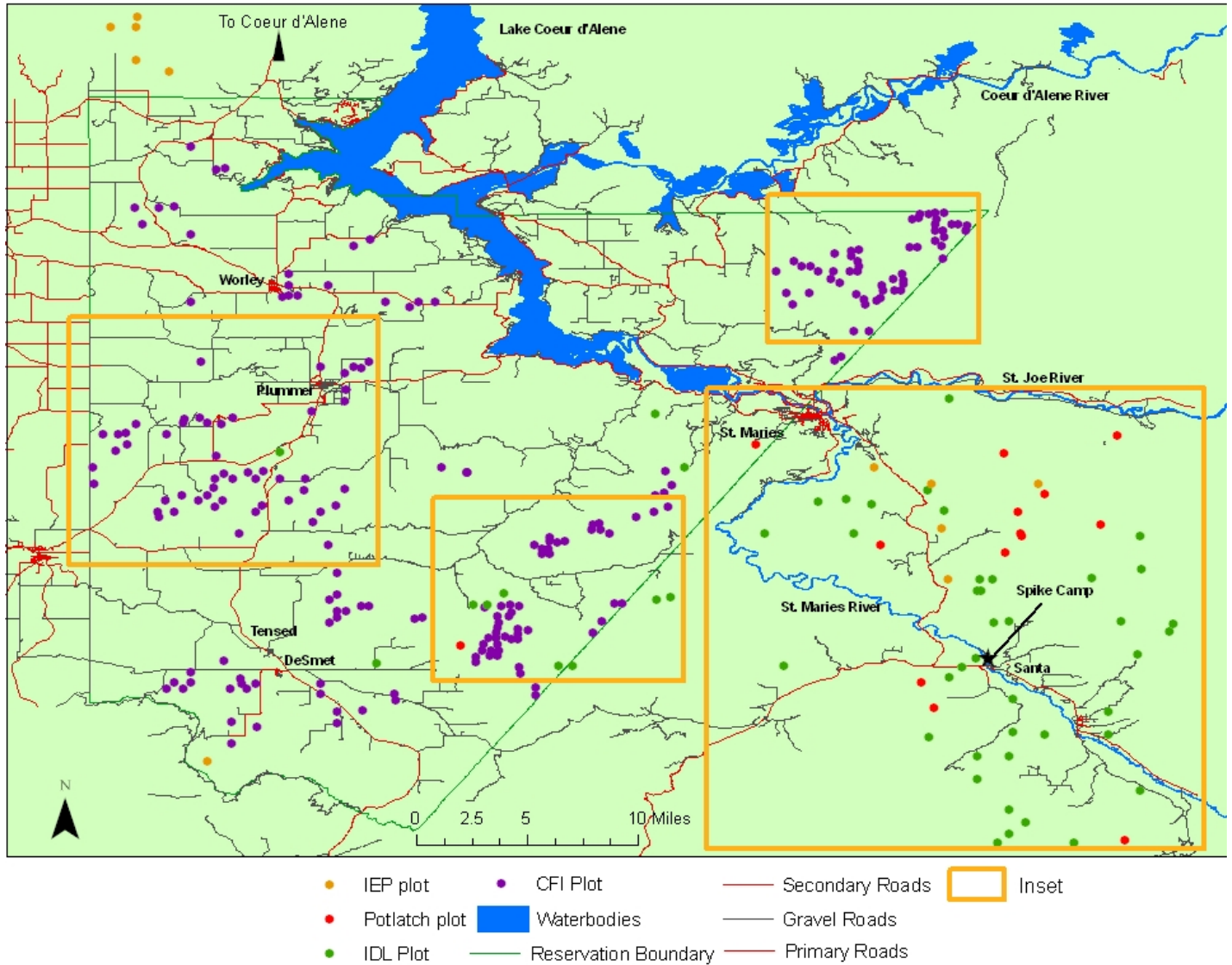


Figure 2: Grassy Mountain area, north end of Reservation.

Grassy Mountain Vicinity

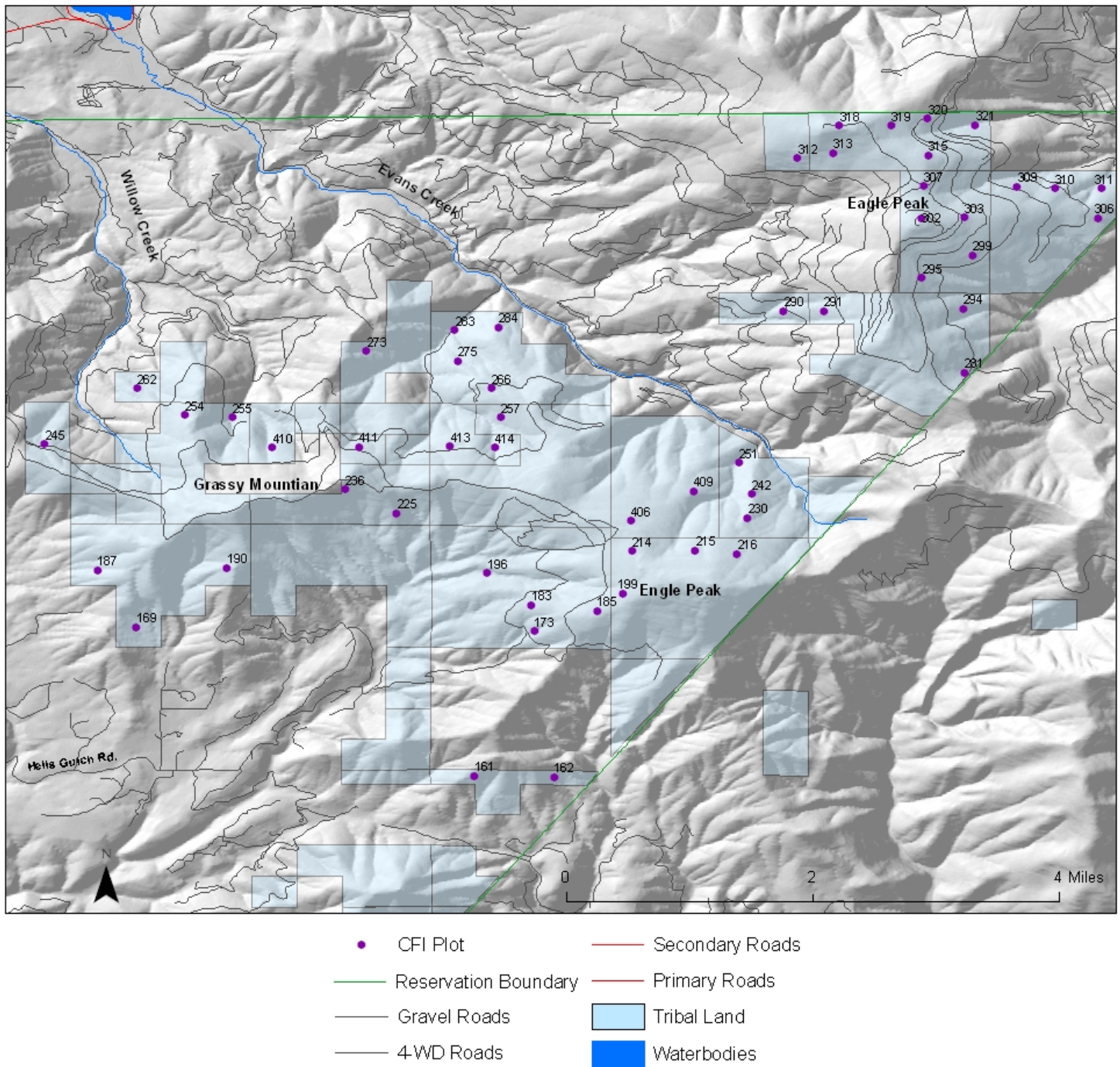


Figure 3: Moses Mountain, east central portion of Reservation.

Moses Mountain / Alder Creek Vicinity

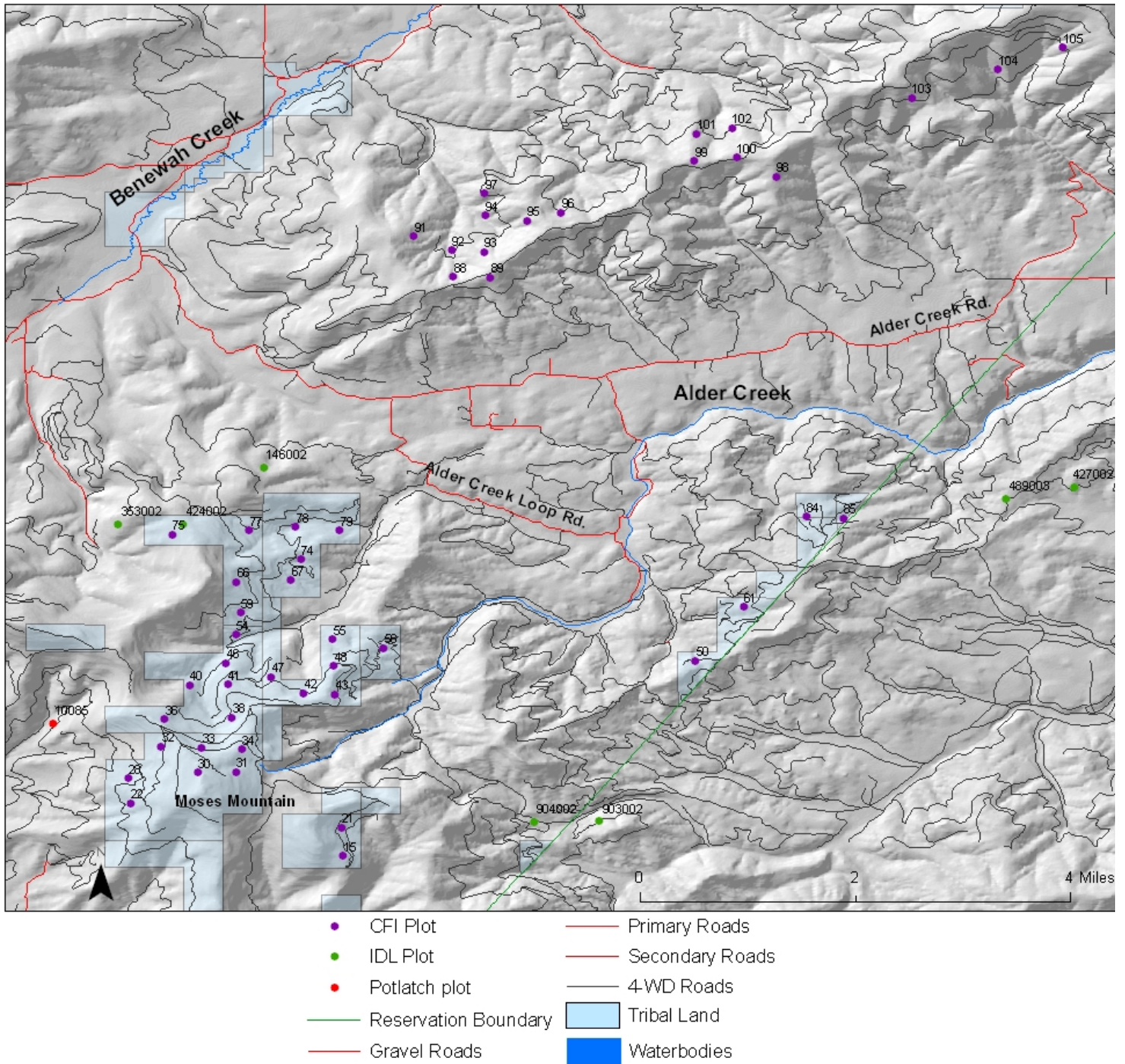
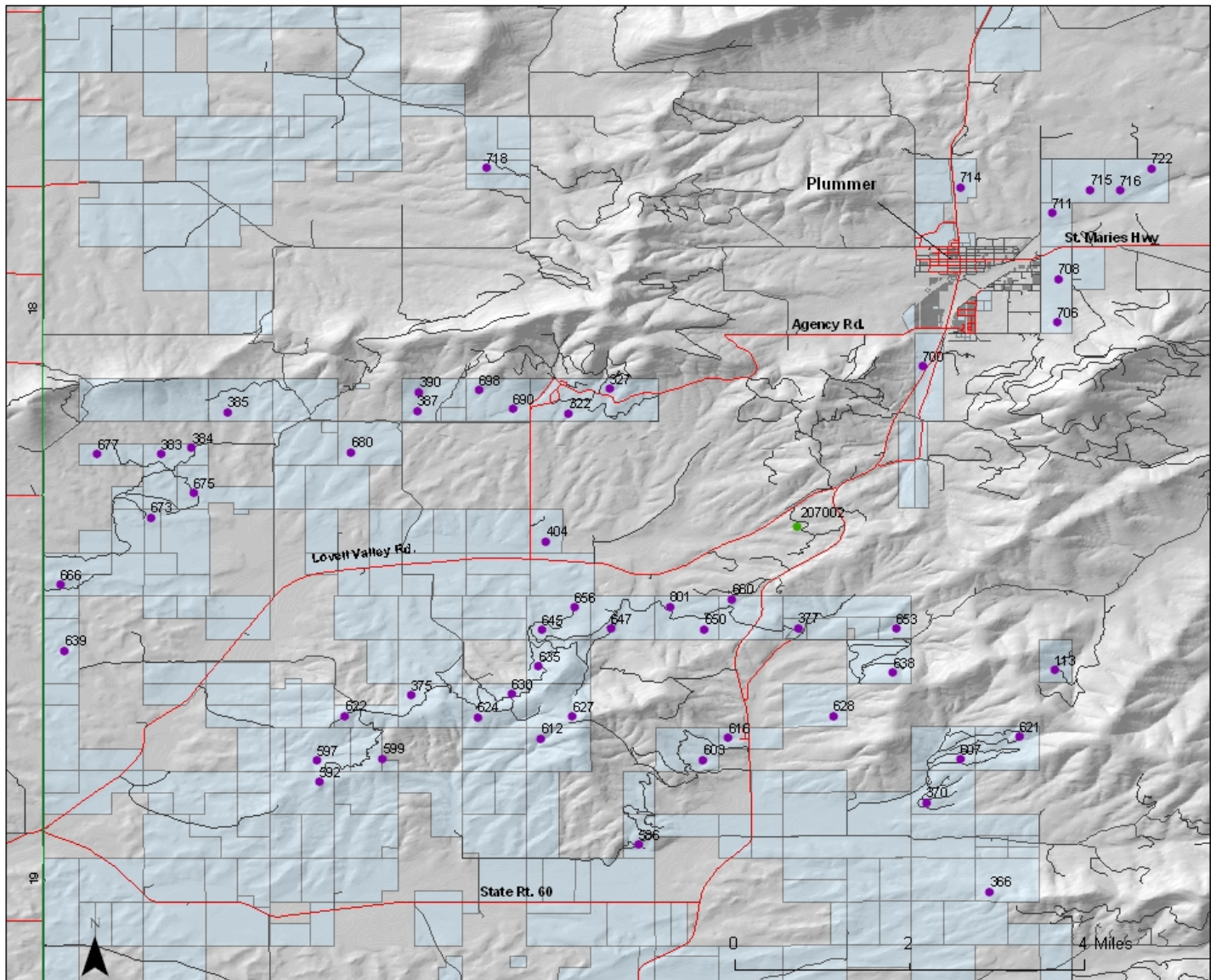


Figure 4: Plummer and surrounding areas, central Reservation.

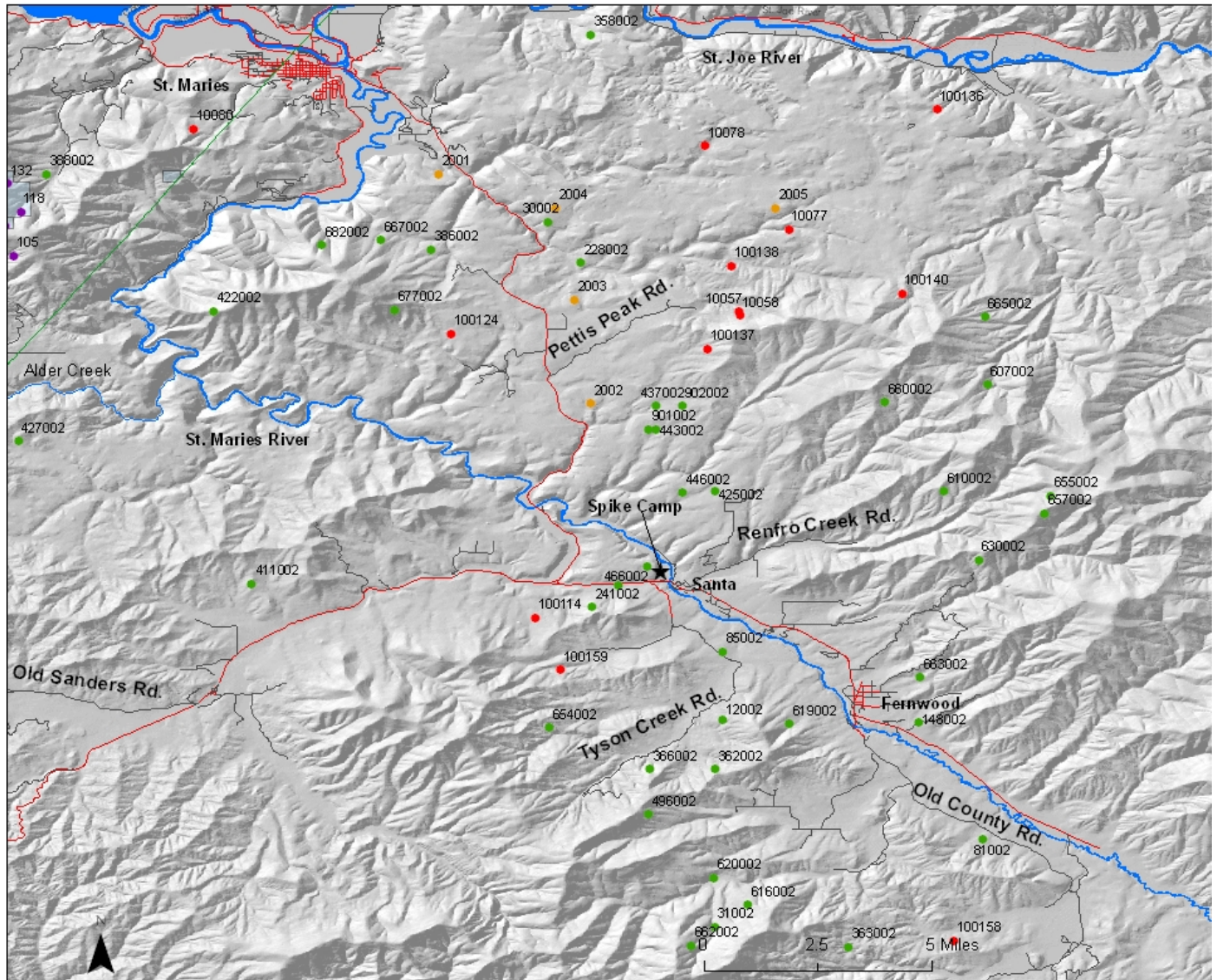
Plummer Vicinity



- | | | |
|-----------------|------------------------|-------------------|
| ● CFI Plot | — Reservation Boundary | — Secondary Roads |
| ● IDL Plot | — Gravel Roads | ■ Waterbodies |
| ● IEP plot | — 4-WD Roads | ■ Tribal Land |
| ● Potlatch plot | — Primary Roads | |

Figure 5: St. Maries and Santa area plots, outside Reservation.

St. Maries Vicinity



- | | | |
|-----------------|------------------------|---------------|
| ● CFI Plot | — Reservation Boundary | ■ Waterbodies |
| ● IDL Plot | — Gravel Roads | ■ Tribal Land |
| ● IEP plot | — Primary Roads | |
| ● Potlatch plot | — Secondary Roads | |

roads layer either no longer exist or they are blocked by locked gates or tank traps. In addition, many roads exist that were not shown as roads on the roads layer. There were also numerous active logging operations and no trespassing signs that kept us from driving directly to our plots. Altogether, we were unable to assess seven IDL plots due to these restrictions. Eventually, we got to nearly all of the IDL plots by undertaking much longer hikes, exploring “unmapped” roads, and by looking at aerial photos to locate roads.

Potlatch Timber Company

Potlatch plots are very well established and relatively easy to locate (Figure 1). We acquired additional maps from Jeff Wolter at Potlatch (Appendix A) to aid in navigation specific to Potlatch property. Most roads for Potlatch were gated, so Jeff also provided us with the necessary gate keys.

Potlatch plots often have two or more points for each plot number very close to each other. In these situations we chose either the first point we located or the one which was easiest to navigate to. There are also plots that have two pieces of rebar “plot center” for each point, one orange and one yellow. We chose the one that appeared to be the most appropriate. Reference trees with the plot number are located along roads near the plot, but they do not give a bearing to follow. We collected all data fields and forms for Potlatch plots.

In the database, Potlatch plots are differentiated from CFI plots numbers by the prefix 100; as in 10085, 85 being the Potlatch assigned number.

Inland Empire Paper Company (IEP)

IEP plots were also relatively easy to locate (Figure 1). Many of the IEP plots are located behind locked gates. We contacted IEP and borrowed keys from Dick Snyder (Appendix A) at the IEP headquarters in Spokane Valley, Washington. Each plot had only one point and one plot center stake with a circular marker identifying it as an IEP/CFI plot, and its plot number. Once the plot was located, we collected the same data fields as were collected for Potlatch and IDL.

IEP plots did not have plot numbers assigned to them when we received their specific locations. We assigned each plot a number based on the chronology of the date we visited each one using the prefix 200, starting at 2001.

Standard Operating Procedures

Basic Navigation

Our primary navigational aid was ESRI ArcPad, which was installed on our Trimble Recon and HP Navman GPS units. We utilized ArcPad with layers supplied to us by the Tribe such as Tribal ownership, gates, streams, and roads. Our roads layer differentiated between primary, secondary, gravel, and four-wheel drive roads, making it easier to find the fastest route to a plot. This method worked fairly well for most of the summer. Later on, we began using our laptops connected with a GPS receiver and antenna to navigate during the drive to our plots. Navigating with the computer proved much easier with its larger screen size and easier interface. With CFI and Potlatch plots, we were often able to spot a reference tree from the road; this made it much easier to find the plot itself. Once out of the truck, we used our GPS units in conjunction with compasses to find plot center. We consistently used a declination of 18° east of north for our compasses.

Plot protocols

When we reached a plot and found plot center, we flagged plot center with pink-polka-dot flagging. We ran tapes out in the cardinal directions and flagged the plot edges at 37.2 feet. We

then ran the north and south transects from plot center to ensure more accurate transect placement. Refer to the illustration below for transect layout.

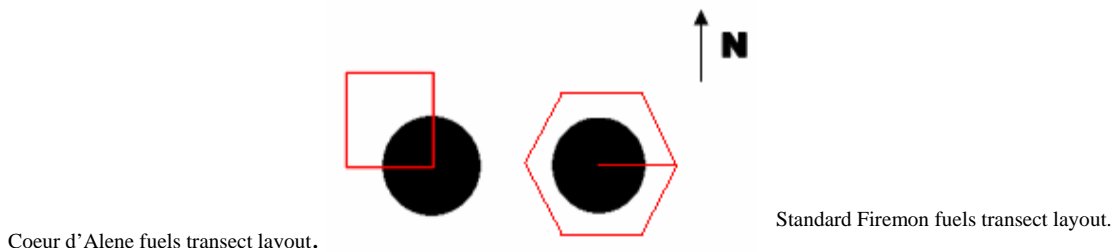


Figure 6: Transect layout styles.

Duties were divided based on the number of trained/untrained workers (volunteers, Tribal youth, etc.) with us at the plot. Plot Description and Species Composition were usually collected by one person. Fuel Loads and Tree Data were collected by groups of two. Following data collection, we took pictures in the cardinal directions with these fields written on a white board: Registration ID, Project ID, Plot ID, the date and the cardinal direction. Finally, we had one person collect all data forms, and collected all flagging marking the plot boundaries except the one marking plot center.

Special Considerations

Cloud and tree cover sometimes hindered the GPS units from receiving adequate signals from satellites. Another limitation of collecting data on the Recons and Navmans was the design of the Firemon applet. After a few weeks we decided it was best to collect all data on paper after several instances of data loss. In August, Ben Butler (Appendix A) customized the Firemon applet specifically for the Coeur d'Alene Tribe's needs, which we then used in addition to collecting the data on paper.

It should be noted that when measuring slope on the fuel transects, we measured using percent slope. It should also be noted that when plot center stakes were not present, a temporary plot center, usually around a sound tree, was established using flagging.

Data collected after October 5th will not reflect summertime conditions due to the loss of leaves by deciduous trees and shrubs as well as forbs that die back in the winter.

There were occasionally technical difficulties with the Recons. All the data that the tribe uses is projected in NAD83. The Trimble and Navman units only worked with WGS84 projections when running the Firemon applet. Secondly, the GPS settings for the Recons differed from the Navmans (Appendix B). Other problems had to do with faulty batteries and screen freezes. We found that not zooming in too far prevents most screen freezes.

Interpretations of FIREMON protocols

Many of the protocols in FIREMON need additional clarification than is found in the current definitions. After consulting with our technical coordinator and Duncan Lutes, co-creator of Firemon at the USFS Fire Lab, we accumulated site specific rules for data collection, which are listed below by field form.

Plot Description

- Total tree cover is an estimate of all tree classes, not only mature trees. The same pertains to shrubs and shrub classes.

- Upper dominant species may not exist in plots without an over story. If there were no upper, mid, or lower dominant species on a plot, we entered "N" for 'not applicable' in the respective field. We considered dominant to mean greater than 5% cover.

-Basal vegetation ground cover rarely exceeded 5-15% but was more often in the 0-1% or 1-5% range.

-We used Anderson's Fuel Models to determine fuel models on the plots. (Appendix B) We also consulted Eric Geisler (Appendix A) for site specific training.

-In some instances there were multiple Fuel Models present on a single plot. In this situation we chose the model that best represents the area.

-If no trees were present on the plot, we recorded stand height as zero.

Fuel Load

- As previously mentioned, the Coeur d'Alene Tribe does not use the standard fuel transect layout of a hexagon, but rather uses a square, starting due north from plot center.

-In numbering logs for coarse woody debris, counting should not begin over from one when you begin a new transect, rather keep the same numbering sequence.

-If a log or piece of fine woody debris crosses a transect multiple times or crosses multiple transects, it should be counted as a separate log each time it crosses.



Figure 7: Jered Hansen and Chris Carlson counting fuels data.

-There is no Firemon protocol for stumps. Do not include them in fuel transect counts or cover estimates (except wood cover estimate in plot description).

-Laying out fuels transects is a less than perfect process. Dense shrubs often made it difficult to nearly impossible to direct a person running out the measuring tape exactly in the direction needed. Often times, we used the best ocular estimate in conjunction with a compass to lay the transect as accurately as possible.

Tree Data

-All tree heights were measured with clinometers that require one to stand 100 feet away from its base.

-We had to estimate tree heights in relation to one tree specifically measured when the tops of other trees in the plot could not be seen from 100 feet with the clinometer.

-For plots with no previously tagged trees, we listed them starting at tag #901 in the database. If a plot had tagged trees, we recorded that number. If there were also any un-tagged trees in the plot, we numbered them beginning with #901 to differentiate them from the tagged trees series.

Species Composition

-If a tree species was present in both in the over story and the under story in high quantities, it may be listed under multiple size classes within that plot. In most situations however, size class was not assessed.

-According to most plant guides, Thimbleberry (RUPA), Pipsissewa (CHUM), Twinflower (LIBO), Kinnikinnick (ARUV), and Oregon Grape (BERE) are considered shrubs, however we found it more appropriate to count them as forbs (in terms of fire behavior) unless the plant was considerably tall or woody. Likewise, Beargrass (XETE) was assessed as a forb, not as grass (Appendix D).

-Some multi-stemmed, tall shrubs such as Rocky Mountain Maple (ACGL) occasionally had stems with a DBH of 4.5 inches or more. In these situations, these individual stems were counted as trees.

-After October 5th, we assessed cover estimates as they appeared at the time, not as we imagined they would be with full leaf cover.

Plant Identification

Species composition was collected to the species level when possible (e.g. *Pinus ponderosa*). We tried to collect a full species list on every plot. We would first write down the most prominent species on the plot (i.e. any species with a cover of over 1%), and then attempt to identify other species present. If we did not know a species, we would collect a sample and identify it later on with field guides. Norris Boothe (Appendix A) trained us to identify a number of local species early in the season, but our primary identification aids were three different field identification books for northern Idaho (Appendix C). See Appendix D for a complete species list collected in 2005.

Photos

We took four photographs at each plot, one in each cardinal direction. We used a small dry erase board to record plot information and displayed the board in an unobtrusive place within the photo. The photos were taken primarily for a visual reference of plot conditions, but also as a backup reference in case there was a question about Plot Description, such as the Anderson Fuel Model, etc. Listed on the dry erase board are the RegID, Project ID, Plot ID, date, and cardinal direction.



Figures 8 and 9: Two photoboard label styles.

Working with Tribal Youth

The tribe hired tribal youth (ages 14-16) to work along with various departments within the tribe during the summer months. One of these groups of interns worked with the GIS department – their main task was to assist us in collecting data. From June to August we had two different groups of four youths working along with us in the field. Though the youth's duties usually consisted of laying out transects, writing down data, and holding the picture board, we also explained all of our data collection methods to them. The youth also got a chance to use GPS units to navigate to plots, as well as learning plant identification skills.

Idaho Environment – Potential Hazards

- Diseased trees/snags

We encountered numerous dead standing trees while walking to and assessing plots. Most of the time, the hazard trees were rotten grand fir, red alder, and occasionally douglas fir. Windy days and wet weather were common times for snags to present hazards.

- Roads

Many of the roads we drove on were extremely narrow, brushy, steep on either side, rutted, muddy, blocked by obstacles or simply remote. Because of this, roads presented one of the primary safety concerns to our crew. We often had to back over large water bars, turn around in tight spots, or back up for long distances in order to extract our vehicle from “sticky” situations.

- Stinging nettle

Stinging nettle was more of a problem during the early season, especially along draws or wet meadows. We “experienced the nettle” more than one time, but it was never detrimental to our work. Identification of nettle is the easiest way to avoid contact.

- Wildlife

We never had actual incidents with wildlife, but we certainly encountered animals that are dangerous. Throughout the season, we encountered at least ten moose, numerous elk, and a black bear.

- Hunting season

Luckily, elk hunting season began just as we were finishing up our plots. However, we still encountered the impacts of the season. Traffic on back roads increased significantly during the season, especially in terms of ATV traffic.

Vehicle Management

The SCA provided one vehicle, a 2004 Chevy Silverado, to complete field work, as well as transporting the crew for other activities. The Tribe provided 3 vehicles for field work, a Dodge Dakota, and two Chevy S-10 Trucks. Each vehicle presented unique challenges and assets in the field. The Silverado was the most durable and reliable vehicle. The logging roads and 4x4 roads were sometimes too overgrown to access or too small to turn around on for a truck of that size. Its long wheel base also made it difficult to drive over deep water bars on the roads. The Dodge Dakota was very easy to navigate on small roads and over water bars. This truck however had many problems with maintenance. The four wheel drive had to be completely overhauled and the tires replaced. The ball joints also had to be replaced and the brakes serviced. The S-10s were relatively easy to drive on small roads. Those trucks however were not reliable. The four wheel drive did not always engage, they had a very low clearance, and were not durable. The gear shifter cable became displaced at one point because alder that was growing in the road caught on it and moved it. Due to their low clearance, the S-10s were prone to high centering.



Figure 10: Truck and view from top of Grassy Mountain.

We recommend using a heavy duty truck, such as the Silverado, or a durable vehicle with high clearance and a short wheel base for driving to future plot locations. In addition, we also recommend that each vehicle also be outfitted with a shovel and Pulaski for knocking down water bars and for other unforeseen circumstances. We also recommend that off road tires be used on all vehicles. The road tires on the Dodge Dakota all had to be replaced about two thirds of the way through the season. The off road tires on the Silverado worked very well and are still in good shape.

Spike Camps

During the months of September and October, we collected data in the St. Maries/Santa area. The drive from Coeur d'Alene to our work site would have been prohibitively time consuming, so we set up a camp in Santa on the property of Jeff Wolter (Appendix A). We made contact with Jeff through Frank Roberts, who was friends with him. Jeff and his family were very hospitable, and arranged for us to camp there. This arrangement worked extremely well, as we had a secure site for us to leave our gear during the day, a fresh water source and an occasional shower. Jeff also provided us with some aerial photographs and gate keys from Potlatch that helped us find our way through the maze of logging roads in the St. Maries area.

At camp we typically cooked communal meals for dinner. The SCA supplied us with a Coleman 2-burner propane stove, a propane lantern, the propane gas, and an extra cooler. Perry Kitt (Appendix A) supplied us with a gear box from a pickup truck to store our food out of the reach of animals. The GIS office also paid for a port-a-john that we had delivered to our camp site.



Figure 11: Spike camp on Jeff Wolter's property.

Due to the drive and length of set-up time, spike camp work schedules were eight ten hour days of work, followed by six days off. This arrangement also made the most sense given the remote location of our plots. We also decided that we collected data most effectively when working as a group of four or five because it allowed us to switch tasks from plot to plot in addition to completing the plots much more quickly. Working in groups of two or three was more effective when traveling to single or isolated plots that required longer-than-usual hikes or that were far from each other.

Other Projects and Events

Training

Wilderness First Aid/ CPR

As part of our SCA training in Boise at the beginning of our internship, we received training in Wilderness First Aid and CPR. The two-and-a-half day class covered topics such as patient assessment and treatment, patient evacuation, situational awareness and CPR. During the first and second day, we discussed a variety of situations, and then 'patients' helped us practice skills in mock emergencies. We learned CPR procedures, and took an exam covering both the CPR and First Aid portions of the class. We thankfully never had to use our First Aid training during the internship, but we do feel better prepared for emergencies as a result of the training.

Wildland Firefighter Red Card

In late June we spent five days in Kooskia, ID completing our Red Card Training. Four days were spent in the classroom learning the techniques and risks of being a wildland firefighter. The fifth day was spent in the field putting out a mock fire. The day in the field helped to develop

the skills and awareness of fire that we were taught in the classroom. The whole training contributed to our better understanding of the data we collected in the field later in the season.

Forest Insect and Disease Identification Workshop

In July, we attended the Forest Insect and Disease Workshop hosted by the Idaho Panhandle National Forests. The first day was spent in the classroom learning the signs and symptoms that trees will display during and after an attack from either diseases or insects. The morning of the second day was divided between more presentations from speakers and quizzing to see if we could accurately identify what caused the damage on sample specimens. The afternoon was spent traveling to different areas to see the impacts that insects and diseases have on northern Idaho's forests. This was useful for us because it helped us to more accurately assess stand health, and identify specific damage to trees.

GIS Projects

We completed two GIS projects during the last few weeks of our internship. The first project was on forest stand delineation. This project consisted of using ArcMap to draw polygons around different stands of forest located within one mile of Lake Coeur d'Alene. Designating Fire Regime Condition Class (FRCC) was the second project we completed. This consisted of evaluating areas in which we had visited using pictures, aerial photography and plot data to determine the FRCC for the vicinity around the plot.

Events

Team Building days

We spent a few days learning about local culture and the area. The goal of these days was to provide experiences other than data collection to enrich the internship. One day was spent at the Museum of Arts and Culture in Spokane learning about local Native American culture and then heading to the Julyamsch Powwow in Post Falls, ID. Another day was spent at the Hobo Cedar Grove in the St. Joe National Forest, east of Clarkia, ID. We brought our Tribal Youth counterparts along with us to the Cedar Grove to show them some areas just off the Reservation that they may not have seen. In a more informal way, there were several team building days throughout the summer with other staff in the GIS office over lunchtime cookouts.



Figure 12: Julyamsch Powwow.

Landfire Field Visit

On October 11th we spent a day working with a Landfire crew, another SCA Corps program based out of the Boise office that were collecting data for the United States Geologic Survey (USGS) in eastern Washington. The day was a good opportunity for us to see the manner in which data is collected on range land rather than in a forest and to see the differences between Firemon and Landfire. They require less data fields to be collected on each plot and also go to great lengths to collect full species lists. It was a great learning experience and provided a chance for us to meet new friends in SCA that are interested in similar conservation issues to ourselves.

Events and Tribal Holidays

In addition to data collection, we also spent time at cultural events. One of the highlights during the internship was the Julyamsch Powwow. It is considered the largest Powwow in the Northwest and one of the largest in the nation. It was held at the Greyhound Event Center on the weekend of July 27th and 28th, 2005.

Other cultural events that we took part in included:

- GIS and IT Longhouse Lunch Celebration: July 15, 2005. The Longhouse lunch was for the opening of the new Community Technology Center, which was built thanks to a large Federal grant. The building houses the offices of several departments, including ours. It also offers free computer access to the community.
- Natural Resources Play Day: July 29, 2005. The Natural Resources Play Day was a chance for the Natural Resource employees and their families to meet each other and to enjoy free time together.
- Cataldo Day: August 15, 2005. Cataldo Day was held at the Cataldo Historical Mission Site. It included a religious ceremony, and recognized the Tribe's history with missionaries. It was an opportunity to learn a little about the Tribe's history.
- Take Pride in Your Tribe: August 26, 2005. Take Pride in Your Tribe was spent socializing, playing softball and eating lunch with tribal employees and members. It was a way to meet people who work for the Tribe from all of the departments.
- Native American Day: September 23, 2005. Native American Day was just a day off to relax and to enjoy time with family and friends.
- Friday Cookouts at the GIS Office: Various dates. Friday potlucks were days when people from the GIS office and the IT office could spend their lunch together. It was a good time to talk to fellow co-workers.
- Water Potato Day: October 28, 2005. Water Potato Day is a historical celebration. For hundreds of years the Coeur d'Alene Tribe gathered together in the fall to collect water potatoes - an important part of their winter diet. It was a time for the Coeur d'Alene people to give thanks to the Creator for the food provided and for family. The modern day celebration is more oriented towards children. This provides an opportunity for schoolchildren to learn about a culturally and historically important practice.

Conclusion

Should this report leave any pertinent questions unanswered, you will find our contact information below and that of the GIS staff, Fuels Management staff, and any additional people who helped us. As the report indicates, this has been a great experience for all of us and our thanks go out to everyone who made our internships possible and helped us along the way.

Contributors

Mike Messier

North Carolina born and raised, I graduated in December 2004 from the University of North Carolina at Chapel Hill with a degree in Anthropology and a minor in Environmental Studies. I applied for this position with the SCA because I was looking to get real world experience in the natural resources field and to spend lots of time working in the outdoors, which I have discovered is what I need in a job to be happy. Upon completion of this internship I will be heading to Carlsbad Caverns National Park in New Mexico for another six month SCA internship with the Native Plant Corps. I can be contacted in the future by phone or email as listed below.



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Helena Pagano

My first year in college was spent at Carroll College in Helena, Montana. I transferred to the University of Colorado at Boulder since it offered more courses and options in the Environmental Studies field. I attended the University of Colorado at Boulder from the fall 2001 until the fall 2004. I graduated in December of 2004 with a B.A. in Environmental Studies. The University did not offer a B.S. in this field, but did offer focuses within the sciences. So I focused in Biogeochemistry and I minored in Geology.

During my college career I was involved with two organizations. For four years I was part of the Colorado Freestyle Ski Team (which was part of the University). I developed a keenness for team building and individual development. I also was part of an organization called AISES, American Indian Science and Engineering Society. This helped me build an appreciation for others and my own professional goals. AISES provides the opportunity for students to talk with professionals and learn about possibilities after attending a college or university.

I hope to build a career or careers that will help Native American communities. When I gain more experience I will be able to create better goals on how I will achieve this. I would like to gain experience with working with non – profit organizations and organizations that focus on communities.



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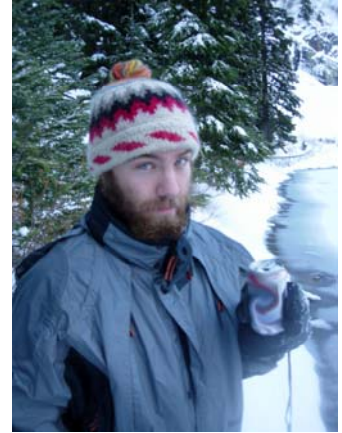
Chris Carlson

For me, this SCA internship served two purposes. First, it complemented my coursework in geography at the University of Oregon, where I am currently a student. Secondly, it was a way for me to spend large amounts of time outdoors near where I grew up, in Missoula, Montana. Immediately after this internship, I will return to Oregon to finish my degree. After that, I see myself entering (and enjoying) a field that allows me to work outdoors.

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Jered Hansen

I was born and raised in Casa Grande, AZ and am a Geography student at Northern Arizona University. I applied for this job to gain real world field experience before graduating from college and to take a much needed break. I was also enticed by the amount of time that would be spent in the woods. I will be returning to Arizona to finish school when the internship is finished. You can contact me either by e-mail or phone if any questions arise. Adios muchachos!

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Kassy Theobald

I am the Project Leader for the Coeur d'Alene FIREMON team. I attended the University of Minnesota and received a BS in Natural Resources and Horticulture. After college, I worked briefly with a researcher working on the National Fire Plan and then moved on to an SCA internship at Grand Canyon National Park. There I filled the position of Volunteer Coordinator and Exotic Species Program Assistant on the Revegetation Crew. After a year in the canyon, I became the Project Leader at the Coeur d'Alene Reservation, again with the SCA. My future plans are yet to be determined, but will no doubt be involved in the conservation world.

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Fire.org www.fire.org Systems for Environmental Management, 2005.

Landfire Website www.landfire.gov US Geological Survey, 2005.

US Forest Service Website <http://www.fia.fs.fed.us/library/papers-presentations/docs/procon.pdf> 1998.

Appendix A Contacts

Tribal contacts:

Frank Roberts, *GIS Manager* 208.686.5307
Manages GIS office and projects for the Tribe.

Josh Arnold, *Former GIS Analyst and Site Coordinator* 208.686.0750
Served as our site coordinator for seven months of project, now works in Planning Dept. for Tribe

James Twoteeth, *GIS Analyst* 208.686.0915
GIS Tech that will be utilizing Firemon data for further processing with additional remote sensing techniques.

Derek McNamara, *GIS Analyst and current Site Coordinator* 208.686.2027
Served as our site coordinator for final two months of project. Derek is the primary contact at the Tribe for Firemon.

Eric Geisler, *Fuels Specialist* 208.686.5030
Consulted with our team, provided some training, and helped us acquire red-card training. Will be using U of I to monitor with Firemon techniques in the future.

John Hartman, *Archaeologist* 208.686.8405
Resource for local natural and cultural history and plant ID guides.

Perry Kitt, *GIS Technician* 208.686.5047
Resource for local natural and cultural history. Also manages supplies and gear for the GIS office.

Janel McCurdy, *Forestry Manager* 208.686.2345
Manages Forestry Department for the Tribe, source for all Tribal gate keys.

Norris Boothe, *Forester* 208.686.1704
Provided species identification training.

SCA Contacts:

Jill Kolodzne, *Firemon Program Manager* 208.424.6734
jkolodzne@thesca.org
Direct supervisor for all Firemon Project Leaders.

Ben Butler, *Technical Coordinator* 208.424.6734
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Supports all technical aspects of Firemon project for SCA teams.

Joey Ruehrwein, *Director of Wildland Fire* 208.424.6734
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Oversees all SCA Wildland fire programs administered from Boise office.

Other Contacts:

Jeff Wolter, *Potlatch Timber Company Forester* 208.245.6438
Source for all Potlatch gate keys. Hosted us on his property outside Santa, ID for all extended spike camp tours.

Dick Snyder, <i>Inland Empire Paper Company Forester</i> Source for all IEP gate keys.	509.924.1911
John Wallace, <i>University of Idaho Research Assistant</i> jwallace@uidaho.edu Contact for further Firemon project working with Eric Geisler.	208.885.7831
Tim Prather, <i>University of Idaho Researcher</i> Contact for further Firemon project working with Eric Geisler.	208.885.9246
Absolute Property Management Rental agency for intern house in Coeur d'Alene.	208.664.4508
St. Maries Septic Source for renting portable toilets during extended spike camp tours.	208.245.4512
Forestry Suppliers Source for new field gear acquired during 2005 season.	800.647.5368

Appendix B Additional Resources

Firemon Technical Field Guide and Applet

SCA's technical coordinator and Firemon project leaders developed a technical field guide that references troubleshooting issues, GPS unit settings, technical definitions, etc. Derek McNamara and the GIS office have copies of this guide on a CD and can make that available. The Tribe also has a copy of the CDA Firemon Applet, which operates with ArcPad on Trimble Recons or HP Navmans in WGS84 for data collection purposes on the same CD.

Anderson's Fuel Models

Fuel models, a field assessed on the Plot Description form, were based on Hal Anderson's fuel models as outlined in Aids to Determining Fuel Models for Estimating Fire Behavior. This document is very useful, with color photographs and descriptions of appropriate fuel models for this area. You can find the document in its entirety at http://www.fs.fed.us/rm/pubs_int/int_gtr122.pdf.

Anderson, Hal E. Aids to Determining Fuel Models for Estimating Fire Behavior. USDA Forest Service, Intermountain Region, 1982.

Appendix C Plant Identification Books

Antos, Coupe, Douglas, Evans, Goward, Ignace, Lloyd, Parish, Pojar, and Robert. Ed. Parish, Robert and Coupe, Ray, and Lloyd, Dennis. Plants of Southern Interior British Columbia and the Inland Northwest. B.C. Ministry of Forests and Lone Pine Pub. 1996.

Johnson, Charles Grier, Jr. Common Plants of the Inland Pacific Northwest. USDA Forest Service, Pacific Northwest Region, 1998.

Patterson, Patricia A., Neiman, Kenneth E., and Tonn, Jonalea R. Field Guide to Forest Plants of Northern Idaho. U.S. Department of Agriculture. April 1985.

Appendix D Complete Species List

Local_Code	Life_Form	Scientific_Name	Common_Name
ABGR	Tree	<i>Abies grandis</i>	grand fir
ABLA	Tree	<i>Abies lasiocarpa</i>	subalpine fir
ACCO	Forb/herb	<i>Aconitum columbianum</i> ssp. <i>columbianum</i>	Columbian monkshood
ACGL	Tree	<i>Acer glabrum</i>	Rocky Mountain maple
ACMIO	Forb/herb	<i>Achillea millefolium</i> var. <i>occidentalis</i>	western yarrow
ACRU2	Forb/herb	<i>Actaea rubra</i>	red baneberry
ADBI	Forb/herb	<i>Adenocaulon bicolor</i>	American trailplant
ALINT	Shrub	<i>Alnus incana</i> ssp. <i>tenuifolia</i>	thinleaf alder
ALOV	Forb/herb	<i>Alysicarpus ovalifolius</i>	alyce clover
ALRU2	Tree	<i>Alnus rubra</i>	red alder
ALVIS	Shrub	<i>Alnus viridis</i> ssp. <i>sinuata</i>	Sitka alder
AMAL	Tree	<i>Amelanchier alnifolia</i>	Saskatoon serviceberry
ANMA	Forb/herb	<i>Anaphalis margaritacea</i>	western pearly everlasting
ANPI	Forb/herb	<i>Anemone piperi</i>	Piper's anemone
ARCO	Forb/herb	<i>Arnica cordifolia</i>	heartleaf arnica
ARLA	Forb/herb	<i>Arnica latifolia</i>	mountain arnica
ASCA	Forb/herb	<i>Asarum caudatum</i>	wildginger
BASA	Forb/herb	<i>Balsamorhiza sagittata</i>	arrowleaf balsamroot
BERE	Subshrub	<i>Berberis repens</i>	Oregon Grape (creeping)
BRVU	Graminoid	<i>Bromus vulgaris</i>	Columbia brome
CAMI	Subshrub	<i>Castilleja miniata</i>	giant red Indian paintbrush
CARU	Graminoid	<i>Calamagrostis rubescens</i>	pinegrass
CESA	Shrub	<i>Ceanothus sanguineus</i>	redstem ceanothus
CEVE	Shrub	<i>Ceanothus velutinus</i>	snowbrush ceanothus
CHME	Forb/herb	<i>Chimaphila menziesii</i>	little prince's pine
CHUM	Forb/herb	<i>Chimaphila umbellata</i>	pipsissewa
CIAR4	Forb/herb	<i>Cirsium arvense</i>	Canada thistle
CILA2	Graminoid	<i>Cinna latifolia</i>	drooping woodreed
CIVU	Forb/herb	<i>Cirsium vulgare</i>	bull thistle
CLUN	Forb/herb	<i>Clintonia uniflora</i>	Bead Lily
COCA13	Forb/herb	<i>Cornus canadensis</i>	bunchberry dogwood
COCA5	Forb/herb	<i>Conyza canadensis</i>	Canadian horseweed
COOC	Forb/herb	<i>Coptis occidentalis</i>	Idaho goldthread
COSE16	Shrub	<i>Cornus sericea</i>	redosier dogwood
CRDO	Shrub	<i>Crataegus douglasii</i>	black hawthorn
DIHO3	Forb/herb	<i>Disporum hookeri</i>	drops of gold
DITR	Forb/herb	<i>Disporum trachycarpum</i>	Wartberry fairy-bell
DOJE	Forb/herb	<i>Dodecatheon jeffreyi</i>	Sierra shootingstar
ELGL	Graminoid	<i>Elymus glaucus</i>	blue wildrye

EPAN	Forb/herb	<i>Epilobium angustifolium</i>	Fireweed
EQAR	Forb/herb	<i>Equisetum arvense</i>	field horsetail
FEID	Graminoid	<i>Festuca idahoensis</i>	Idaho fescue
FRVE	Forb/herb	<i>Fragaria vesca</i>	woodland strawberry
FRVI	Forb/herb	<i>Fragaria virginiana</i>	Virginia strawberry
GABO	Forb/herb	<i>Galium boreale</i>	Northern Bedstraw
GATR	Forb/herb	<i>Galium triflorum</i>	sweetscented bedstraw
GOOB	Forb/herb	<i>Goodyera oblongifolia</i>	western rattlesnake plantain
HECY	Forb/herb	<i>Heuchera cylindrica</i>	roundleaf alumroot
HELA	Forb/herb	<i>Heracleum lanatum</i>	Cow parsnip
HIAL	Forb/herb	<i>Hieracium albertinum</i>	Western Hawkweed (fuzzy leaves)
HIAU	Forb/herb	<i>Hieracium aurantiacum</i>	hawkweed (invasive orange)
HODI	Shrub	<i>Holodiscus discolor</i>	oceanspray
HYPE	Forb/herb	<i>Hypericum perforatum</i>	common St. Johnswort
LAOC	Tree	<i>Larix occidentalis</i>	western larch
LEVU	Forb/herb	<i>Leucanthemum vulgare</i>	oxeye daisy
LIBO	Vine	<i>Linnaea borealis</i>	twinline
LOTR	Forb/herb	<i>Lomatium triternatum</i>	nineleaf biscuitroot
LOUT	Shrub	<i>Lonicera utahensis</i>	Red Twinberry
LUSE	Subshrub	<i>Lupinus sericeus</i>	silky lupine
MEFE	Shrub	<i>Menziesia ferruginea</i>	Fool's Huckleberry
MI	Forb/herb	<i>Mitella</i>	miterwort
OSCH	Forb/herb	<i>Osmorhiza chilensis</i>	Mountain sweet cicely
PAMY	Shrub	<i>Paxistima myrsinites</i>	Pachistima
PEBR	Forb/herb	<i>Pedicularis bracteosa</i>	bracted lousewort
PHLE	Shrub	<i>Philadelphus lewisii</i>	Syringa / mockorange
PHMA	Shrub	<i>Physocarpus malvaceus</i>	ninebark
PHPR3	Graminoid	<i>Phleum pratense</i>	timothy grass
PICO	Tree	<i>Pinus contorta</i>	lodgepole pine
PIEN	Tree	<i>Picea engelmannii</i>	Engelmann spruce
PIMO	Tree	<i>Pinus monticola</i>	western white pine
PIPO	Tree	<i>pinus ponderosa</i>	ponderosa pine
POBAT	Tree	<i>Populus balsamifera</i> ssp. <i>trichocarpa</i>	black cottonwood
POGL	Forb/herb	<i>Potentilla glandulosa</i>	sticky cinquefoil
POGR	Forb/herb	<i>Potentilla gracilis</i>	cinquefoil
POMU	Forb/herb	<i>Polystichum munitum</i>	western swordfern
POTRE	Tree	<i>Populus tremuloides</i>	quaking aspen
PREM	Tree	<i>Prunus emarginata</i>	bitter cherry
PRVI	Shrub	<i>Prunus virginiana</i>	chokecherry
PRVU	Forb/herb	<i>Prunella vulgaris</i>	common selfheal
PSME	Tree	<i>Pseudotsuga menziesii</i>	Douglas-fir
PTAN	Forb/herb	<i>Pterospora andromedea</i>	pinedrops
PTAQ	Forb/herb	<i>Pteridium aquilinum</i>	western brackenfern
PYAS	Subshrub	<i>Pyrola asarifolia</i>	wintergreen
RHAL	Shrub	<i>Rhododendron albiflorum</i>	White rhododendron

RILA	Shrub	Ribes lacustre	prickly currant
RIVI	Shrub	Ribes viscosissimum	sticky currant
ROGY	Subshrub	Rosa gymnocarpa	dwarf rose
RONU	Shrub	Rosa nutkana	Nootka rose
RUPA	Forb/herb	Rubus parviflorus	thimbleberry
SAME	Shrub	Sambucus cerulea	Blue Elderberry
SASC	Tree	Salix scouleriana	Scouler's willow
SMRA	Forb/herb	Smilacina racemosa	false Solomon's seal
SMST	Forb/herb	Smilacina stellata	starry Solomon's seal
SOSC	Tree	Sorbus scopulina	Mountain Ash
SPBE	Subshrub	Spiraea betulifolia var. lucida	spirea (shiny-leaf)
SYAL	Shrub	Symphoricarpos albus	snowberry
SYMO	Subshrub	Symphoricarpos mollis	creeping snowberry
TABR	Tree	Taxus brevifolia	Pacific yew
TAOF	Forb/herb	Taraxacum officinale	common dandelion
THOC	Forb/herb	Thalictrum occidentale	western meadow-rue
THPL	Tree	Thuja plicata	western red cedar
TITR	Forb/herb	Tiarella trifoliata	False Mitrewort (Coolwort foamflower)
TRCA	Forb/herb	Trautvetteria caroliniensis	false bugbane
TROV	Forb/herb	Trillium ovatum	Trillium
TSHE	Tree	Tsuga heterophylla	western hemlock
TSME	Tree	Tsuga mertensiana	mountain hemlock
VAME	Shrub	Vaccinium membranaceum	thinleaf huckleberry
VECA	Forb/herb	Veratrum californicum	California false hellebore
VETH	Forb/herb	Verbascum thapsus	common mullein
VIAM	Vine	Vicia americana	American vetch
VIGL	Forb/herb	Viola glabella	pioneer violet
XETE	Forb/herb	Xerophyllum tenax	common beargrass

Appendix E Inventory and Ownership of Equipment

SCA provided the following equipment to complete field work:

- 2 Dell Latitude D505 Laptop Computers
- 2 Trimble Recon GPS Units
- 2 Nikon Coolpix 4600 Digital Cameras and rechargeable batteries
- 4 Whiteboard tiles (Used as photoboards)
- 1 HP 3840 Laser Printer
- 1 Cell phone
- 1 Husky Power Inverter
- 1 Chevy Silverado
- 1 First Aid kit
- Assorted Camping gear for extended field tours
- Uniforms for crew

The CDA Tribe provided the following equipment to complete field work:

- 2 HP Navman GPS Units
- 2 Nikon Coolpix 5200 Digital Cameras and rechargeable batteries
- 4 Field Vests
- 4 Compasses (Silva and Brunton – one was not functional)
- 4 Clinometers (3 100 foot Suuntos, and 1 66 foot Suunto)
- 4 Plastic 100 foot measuring tapes
- 4 DBH tapes (three 75 foot tapes and one 50 foot tape)
- 4 Kenwood portable radios
- 1 CB Radio
- 1 Dodge Dakota Truck
- 2 Chevy S10 Trucks
- 4 Plant Identification Books
- 3 First Aid kits
- 2 ArcGIS 9 Software Applications for Laptops
- 2 ArcPad Software Applications for Laptops

All field gear supplied through the SCA was accounted for and returned to the SCA office in Boise to use for the next season's field crews at other sites. All field gear from the Tribe was accounted for and returned to the GIS Office, Forestry Department, and Fuels Management.

Appendix F Recommendations to SCA

Health Insurance

The health insurance provided by the SCA proved to be limited in its coverage for non-emergency related visits in small-town scenarios, where most SCA interns live and work. Should an intern become sick while in the field, he or she may not be covered for health care services provided locally and may be required to travel long distances to receive medical care provided by SCA member benefits.

Gear for Camping

In the future, it would be beneficial for SCA to supply camping gear for field tours. For the length of time that we were in the field exclusively, using our personal gear was not a problem. Had we been out longer, the wear and tear on our gear for work purposes would have been unacceptable. Providing camping gear for a crew would be more appropriate, especially because the crew is composed of volunteers.

More and Better Communication Options

Cell phones proved to be a very unreliable method of communication. Most of the time, there was no cell phone service anywhere near plot locations. We had portable radios, which worked within a mile or two of each other, but not well over hills. We did have a CB radio in one truck, but not in all vehicles. Thankfully, we never had an emergency that required immediate evacuation. Many of the locations that we visited could be considered wilderness in the context of a medical emergency in that an evacuation would have taken much longer than two hours to definitive medical care. Given the terrain that we hike, the distance that we drive, and the nature of the environments that we work in, a more reliable communication method is desirable.

More Problems That May Arise With the Trucks

In addition to the basic flat tire, fluids/air check, and general maintenance training, we think the SCA should provide a more in-depth discussion on problems that may arise with the trucks. We should be provided with a more up front, realistic idea of what acceptable wear and tear will occur under normal circumstances while driving to plots. We should also be prepared for situations other than flat tires, such as how to drive in muddy, rocky, shrubby conditions.

Realities of Wear and Tear on Equipment

The nature of our job necessitates using expensive equipment in a less than delicate manner, especially our vehicle. Navigating to plots necessitates driving through brush and over rough roads. Wear and tear on a vehicle is inherent in these situations. Cosmetic damage, such as paint scratches, is inevitable and should be considered normal wear and tear. We took all reasonable precautions to ensure the truck did not sustain more damage than necessary. Most modern trucks are factory equipped with plastic bumpers and air-dams under the front bumper. Our crew chose to remove the air-dam because it severely reduced the truck's clearance (easily replaced prior to returning the truck). We think the SCA should more clearly outline what it accepts as normal wear and tear and what damage requires an incident report.